Environmental Information: Pressures, Types, and Usage

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Abstract

Global warming, manmade pollution, and pressure from various stakeholders are among the factors that drive business organisations to strike a balance in their operations by reducing negative impact on the environment and society, while increasing the company's wealth. In response to these pressures, one common method is voluntary disclosure of information on environmental impact through publication of corporate social responsibility report. The majority of studies on company's environmental issues primarily look from the external viewpoint. This paper takes an alternative approach focusing on processes in relation to the management of environmental issues. Among the areas explored are pressure factors that lead managers to adopting sustainability management, the types of environmental information being considered, its usage, and the users. The findings derived from interviews with several key personnel revealed that a number of external and internal pressures lead to a variety of internal users from different departments in the organisation.

***Keywords*:** Legitimacy, institutional theory, environmental information

1.0 Introduction

In this 21st century competitive business world, one major concern by all sizes of organisations is no other than maximising profit. However, coupled with the pressing pressures on concern for environmental and social aspects, organisations are driven to strike a balance in their operations where they need to reduce their negative impacts on the environment and society, while increasing their economic wealth. One of the main reasons that forces business organisations worldwide to reflect upon their environmental issues more seriously is none other than natural calamities. In today's condition where climate uncertainty is certain, environmental circumstances such as droughts and floods have affected global agricultural production resulting in volatile commodity pricing. Manmade disasters, like the Exxon Valdez oil-spill that polluted almost 500 miles of coastline, natural disasters, like the 1997 Asian tsunami, and global

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climate change are among examples of major misfortunes that have impede business activities causing huge financial losses (Accounting for Sustainability, 2012).

Other reasons may include reducing cost. Many businesses invest in environmental improvement simply to deliver cost savings through efficiency and innovation in generating products and its related processes. Another pressing matter is the volatility of commodity pricing. The changes in climate that causes droughts or major floods lead to decline of global production of commodities, such as cotton or grain, which in turn, becomes the reason for sharp increases in price and shortage problems (Accounting for Sustainability, 2012). Therefore, given its weightage on the income statement and balance sheet implications, many businesses are now considering environmental issues as a significant aspect of their business issues. Following this development, the area of environmental management is now recognised by many as an area that needs to be fostered holistically, particularly on its linkage with business performance (Gray & Bebbington, 2001).

In addition, businesses are challenged by pressure from numerous sources, namely from the government, society, and market forces, to developed more efficient environmental management practices (Schaltegger, Hahn, & Burritt, 2000). Governments around the globe have been introducing newly environmental-related legislations, tax rebates, and exemptions. Furthermore, the demand from the market and society for greener products and business practices have forced business organisations to upgrade their environmental management practices for better legitimacy and competitiveness. One common way of coping with the abovementioned pressures is by voluntarily disclosing environmental related information through a corporate social responsibility report. Prior studies in this area often focus on the determinants of environmental reporting, specifically relating to the reasons for a company to undertake reporting as well as factors that influence the content of their reports. Prior studies have analysed the link between environmental reporting with the size of the organisation (Orlitzky, 2001; Patten, 2002), and type of industry (Purushothaman, Tower, Hncock, & Taplin, 2000; Patten, 2002).

The key arguments explaining the reasons as to how and why business organisations conduct environmental reporting suggested that organisations report as a form of response toward fulfilling the needs of decision-makers (Parker, 1991), gaining legitimacy in the eyes of the public (Deegan, 2002; O'Donovan, 2002), attempting to manage stakeholders (Neu, Warsame, & Pedwell, 1998), and to some extent, influencing "other voices" that are fundamental in establishing political and philosophical questions (Owen, Gray, & Bebbington, 1997). Nevertheless, despite the motivation for environmental reporting being significantly theorised, studies are still inconclusive on the

theory for social and environmental accounting (Gray, Walters, Bebbington, & Thompson, 1995), particularly in accounting aspects that are linked to environmental management. It is interesting to note that the majority of studies on business organisations' reaction to environmental-related pressures had been emphasising on the external viewpoint, where attention is very much given to what are being reported to the public, as well as its underlying reasons. Conversely, at present, there is still a scarcity of information that focuses on why environmental information is produced and how it functions, particularly from the internal usage perspective.

Therefore, taking into consideration the gap in literature, this was a study that attempted to ascertain the pressures that lead to the generation and usage of environmental information in supporting the various core functions of the business organisations in a privately-owned company. Study of this nature is timely given the fact that business organisations are now expected to put in place environmental management practices that explicitly link between environmental performance and economic performance. Looking at the present nature of business strategies and operations where environmental friendly innovation and investment are becoming more substantial, the existence and role of quantified environmental information, as well as its respective tools, must be acknowledged in order to justify the impact of environmental activities toward business wellbeing. Hence, there is a two-fold objective of this study. Firstly, this study intended to pinpoint the types of pressures that prompted business organisations in providing environmental information for business decision making. Secondly, the study aimed to pinpoint the environmental information, specifically on its types, usage, recipients, and functions.

The remaining of the paper is structured based on the following order. The next section provides a review of literature examining the causes that push for implementation of environmental practices, identifying the types of generated environmental information, and investigating to what extent the information is being used and who are the users, and the usage of such information within organisations. This is then followed by the research methodology used in this study and the context of the study is briefly described. Then, the case findings and discussion are presented, and lastly followed by the conclusion.

2.0 Literature Review

2.1 Theoretical Insights

This study was built from the theoretical insights of legitimacy theory and new institutional sociology (NIS) theory. Both theories are complementary given that they provide some understanding on the motivation of environmental

management practices, as well as the purpose and intended consequences of such actions.

Environmental management practices are regarded as actions by organisations to legitimise their internal practices or to demonstrate that they do appear to manage their environmental impact in response to pressure. Legitimacy is needed for organisations to survive (Meyer & Rowan, 1977) given the reality that organisations that are perceived by its stakeholders to be legitimate will find it easier to attract economic resources as well as obtaining support from social and political aspects. Hence, Suchman (1995) put forth and defined legitimacy as "a generalised perception or assumption that the actions of an entity are desirable or appropriate within some socially constructed system of norms, values and definitions". Furthermore, the theory of legitimacy proposed that at any time a manager considers information (including environmental information) which is vital for the survival of the organisation, the manager is said to be pursuing strategies to ensure the continued information to either gain or maintain legitimacy (Deegan, 2002).

Organisations rely on economic resources to survive while at the same time must gain legitimacy and acceptance by the society in which they operate, in order to stay relevant in the long run (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Therefore, organisations in turn conform to institutional pressures by making structural changes or adopt certain practices. In 1983, DiMaggio and Powell suggested three institutional isomorphism namely coercive isomorphism that stems from external pressures such as government mandate exerted on organisations in an environment where they are dependent for resources or support. The second is mimetic isomorphism that occurs when the organisation copies other successful organisations under uncertainty situations. When faced with ambiguous situation, an organisation is likely to follow other organisations that are being perceived as legitimate or successful in order to maintain legitimacy or at very least to reduce the cost of uncertainty. Lastly is normative isomorphism, an influence toward organisational practices due to society and professional bodies' norms and rules. For example, Hines (1991) explained that for a particular conceptual framework project to be perceived legitimate, the accounting profession would be included as they function as a source of social legitimacy.

Pressure from the institutions force organisations to change their practices to be consistent with what that had been mandated (Granlund & Lukka 1998). A literature review revealed that government agencies are the most visible stakeholders or drivers to affect corporate environmental practices (Subramaniam, Wahyuni, Cooper, Leung, & Wines, 2015; Delmas & Toffer 2004; Hoffman 2001). According to Delmas (2002), ISO14001 certification is more popular in Europe than in the United States of America primarily because of more incentives provided by various governments in Europe.

In the context of this study, NIS assists in the identification of institutional forces that lead the organisation in adhering to sustainability practices. Given the fact that sources of legitimacy may well be embedded within the organisation itself, in terms of founding legacy (Stinchcombe, 1965) and through the practices and actions of its members (Lawrence, Suddaby, & Leca, 2011), the legitimacy theory provides some understanding regarding the provision of information by managers in shaping or changing the perceptions on legitimacy. In other words, organisations will do the necessary actions to maintain their image as a legitimate business entity and one of the way of achieving this is through provision and usage of information to gain support and approval (Behram, 2015; Gray, Owen, & Adams, 1996). Since the study aimed to understand the institutional pressure that drives organisations to adopt sustainability practices and also to identify the types of information generated by internal managers and its usage in order to achieve or maintain legitimacy, both theories are able to explain the abovementioned behaviour.

2.2 Environmental Management Accounting Framework

Environmental Management Accounting (EMA) can be defined as "using monetary and physical information for internal management use". Thus, a point to note is that EMA relies heavily on non-financial information, especially with regard to inputs, outputs, and flows of energy, material, and water. Its final objective is to provide information to support environmental-related decision making by mainstream financial managers. One of the key objectives of EMA is "to provide accurate and relevant information for decision making, which have an impact on both environmental and financial performance of an organisation. (Lee, 2008).

The EMA framework includes both monetary environmental management accounting (MEMA) and physical environmental management accounting (PEMA). MEMA includes the environmentally differentiated conventional management accounting system, dealing with environmentally-driven impacts and is expressed in monetary terms. The focal point of MEMA is to function as a general tool used as a basis for internal management-related decisions and also to address issues like track, trace, and treat environmentally driven costs (Schaltegger, Hahn, & Burritt, 2002).

PEMA on the other hand acts as an informational tool in assisting internal management decisions and it focuses on the company's ecological impact on the natural environment, and is expressed in terms of physical units like kilograms. PEMA is designed in such a way that it collects environmental impact related information in physical units for internal usage by the management (Schaltegger et al., 2000; Schaltegger et al., 2002). As an internal accounting approach, PEMA serves the following functions; an analytical tool designed to detect ecological

strengths and weaknesses; a measurement tool that is an integral part of other environmental measures such as eco-efficiency; a decision-support technique that highlights relevant environmental quality; a tool for direct and indirect control of environmental consequences; an accountability tool to provide neutral and transparent base for internal and external communication; and as a tool with a close and complementary fit to the set of tools developed to help promote ecologically sustainable development.

The EMA framework had been adapted by several researchers especially in exploring its suitability in helping companies to achieve cleaner production and at the same time, achieve cost reduction in production processes. For instance, Staniskis and Stasiskiene (2006) looked into the adoption of EMA practices in Lithuanian SMEs. Their study revealed that the implementation of EMA allows for easy tracking of significant environmental costs to respective products (example, material tracking for material costs and other related product costs, such as energy, water use, and others) and waste streams. The availability of such information is vital for decision making in the effort to achieve sustainable development and also in increasing the accuracy of cost estimation, capital investment, process or product design, and other decision making processes (Staniskis & Stasiskiene, 2006). As such, the EMA framework provided needed guidance in determining the types of environmental information that is being generated by the internal managers in organisations.

Also, many researchers have instigated the use of social and environmental information (Guidry & Patten, 2010; Rikhardsson & Holm, 2008; Milne & Patten, 2002). Nevertheless, it is worth to note that by far, the focus of these studies was on external users. For example, most studies explained that disclosure of social and environmental aspects has information content, and that investors and other external parties do take into consideration of such information in their decision making. To date, not many studies examined the usage of social and environmental information for internal users (Madein & Sholihin, 2015). One study of such nature was carried out by Tanc and Gokoglan (2015) on the sensitivity of manufacturing companies in the industrial zone of Turkey. The research reported that a high number of managers are aware of the concepts and approaches to use with regard to environmental information, but there is still lack of information on its applicability. The study also revealed that the pressures of incorporating environmental information within accounting for decision making are largely due to cost reduction, increase value-added toward organisations, and ensuring their survival in the competitive world.

It is interesting to note that in order for environmental management to be successfully implemented, the biggest supporting factor is cooperation and communication between individuals involved in the different functions of the organisation (Hoffman, 2001). Delmas (2002) went further explaining that

managers depend on their routines and decide which appropriate information is needed for their decision making. Nevertheless, there is a gap in the research area regarding the consideration of managers as internal users, particularly with regard to the purpose of environmental information generation and usage.

This research attempted to provide a deeper understanding regarding the management of environmental information by identifying the arrays of environmental information that are generated by managers based on the four dimensions of EMA framework. One of the main criticisms of the EMA framework is the fact that it does not explain the processes as to how decision makers in the organisation manage their environmental information, particularly on its usage. Therefore, this study applied a broader perspective by identifying the following as well, i.e., the institutional pressure that leads to sustainability practices, the sources of environmental information, the internal users of the environmental information, and the usage of environmental information.

3.0 Research Methodology

This study applied the case study method given that the study aimed to understand processes relating to the organisational members' experience and attitudes (Patton & Cochran, 2002). Qualitative study has the ability to probe into responses or observations in order to obtain more detailed and related descriptions and explanations in answering the why and how questions. Furthermore, the basis of qualitative research lies in the interpretative approach to social reality and in the description of the lived experience of human beings. Therefore, this particular study was intended to understand the experiences of managers from the areas of sustainability and finance, particularly regarding the extent of usage of environmental information for various purposes such as decision making. The need to undertake qualitative study is further validated as this study aimed to understand how environmental information is being used.

Prior research (Burritt, Hahn, & Schaltegger, 2011; (Bennet et al., 2013) in environmental management accounting revealed that middle managers are often the main actors that are involved in sustainability management or even in sustainability accounting. The accountant's involvement in directing data generation and communication of information whether across departments or to higher management is limited or very little as compared to sustainability managers or general managers.

The company that was selected for the pilot study was selected from the service industry. The privately-owned company was selected based on the following key considerations. The first consideration was that the company has positive reputation with regard to their sustainability management as reflected in their

corporate social responsibility report. Secondly the company was from an environmentally sensitive industry, and lastly the company has achieved a green award, such as the Frost and Sullivan Award and certification of ISO14001.

A background research was conducted, followed by eight interviews with key personnel of the privately-owned company. Semi-structured interviews were used to allow individuals to express themselves in their own words and follow-up questions were asked when appropriate (Eriksson & Kovalainen, 2011). Interviews are a useful method in obtaining the story on participants' experiences as they allow interaction that would bring about in-depth information around the topic (McNamara, 1999). Interviews were tape-recorded and transcribed with permission from the respondents. Also, secondary data sources such as company corporate social responsibility reports and other related documents were extensively reviewed. This was to ensure that data are from different sources and triangulation of evidence was carried out whereby the information from one source was assessed by comparing it with other sources of evidence and interviewing different people on the same issues (Scapens, 1990).

4.0 Findings and Discussion

4.1 The External and Internal Pressures of Environmental Information Provision

Privately-owned companies were under several external and internal pressures that lead to measuring and monitoring of environmental related information in order to disseminate information to stakeholders (gaining legitimacy). For example, pressure from governmental regulators had led the privately-owned company in collecting environmental information such as energy consumption and carbon dioxide emission, as commented by the Health, Safety, and Environment (HSE) Officer 1:

> *"We here just collect the data once the project is completed because we need to give the data to the Governmental Authority. It is because the Governmental Authority got the Green Policy in placed last year (2014), and from these policies they request certain information, like the amount of CO_2 emission"*.

The action of complying with the authority figures and governmental regulators showed an act that demonstrates the responsibility with the implicit objective of influencing the public, in this case, the local authorities. Therefore, in order to ensure survival of the organisation, HSE department will continue to supply that information to maintain legitimacy. The findings are aligned with other research results (Delmas & Toffer, 2004; Hoffman, 2001) that government (coercive pressure) is the most observable stakeholder that affects organisational practices.

Besides external pressures faced by privately-owned companies, they also face internal pressure which is the desire of top management in obtaining certification to improve the company's reputation and to attract more sales through the recognition of such certification. This was pointed out by the Business Optimisation Unit (BOU) Officer, a unit that plays a similar role to sustainability department:

> *"A way to demonstrate we are complying with the standards. Yes, and also we also follow the environmental management system (EMS)".*

Apart from that, the privately-owned company is also being pressured into reducing its operational costs. The hike in diesel prices which is part of the major chunk of expenses similarly pushes them to be more sustainable. As put forth by the HSE Officer 2,

> *"The return of investment on e-RTG, reduce the maintenance costs, so basically, those are the reasons we embark the project. Apart of that, it is the environmental factor. Once reduce fuel, we are going to save fuel. It is after that we realised the side effect include the benefits toward environment".*

Such practices are also aligned with Suchman's research findings explaining how organisations try to achieve the state of legitimacy by creating perception among stakeholders in order to gain economic resources and support, which are vital for organisation survival. The privately-owned company presented the business case to gain support from the board of directors emphasising on the benefits toward the environment, with the change to electrify machinery through the reduction of carbon emission, while at the same time reduce operating expenses as the new machine has lower maintenance costs.

Another pressure worth mentioning is the one by the owners which has a very strong influence over environmental practices, and this strong environmental culture has a spill-over effect into the privately-owned firm. The Chief Financial Officer (CFO), said that,

> *"We are lucky as our one of owners is very strong in environmental aspect. They build the largest vehicles in the world, the triple Es, one of the E is environment. They also make sure their product is environmentally most advance in the world, so they wanted our equipment to be as well. It is one of the conditions that we don't jeopardize our CO2 emission even though our volume is increasing".*

The abovementioned pressure is not part of any institutional isomorphism that forces the company to conform to, but instead this pressure comes from

the internal perspective and in this case the owner of the privately-owned company.

4.2 Type and Source of Environmental Information

4.2.1 Source of Environmental Information

According to Bennet et al., (2013), a wide variety of different individuals and functions can be involved in collecting environmental information and not restricted to operational or the sustainability department. In the given two companies, a variety of actors are actually involved in generating environmental information. Using the collection of information on energy consumption for example, the privately-owned company purposely established a new unit known as Business Optimisation Unit which also comprises Process Review Team that plays the role of monitoring and collecting utilities consumption. Though the portfolio of waste management falls under the care of the technical team, all monitoring, measuring, and compliance with scheduled waste as required by governmental regulators are a joint effort between the technical team and HSE department. Despite that, the HSE department plays more of an advisory role in ensuring the technical team complies with all imposed regulations. As commented:

> *"It is actually the joint effort between HSE and Technical team. Technical team is actually the biggest waste producer, the lubricant, grease, oil use for maintenance purposes. All these scheduled are being generated and mainly consumed over there. HSE plays the role of advising, educating and audit the Technical Team to make sure they comply with the regulations".*

The HSE department of a privately-held company plays a limited role in generating environmental information, but rather the role was carried out by Process Review Team, Technical Team, and respective Business Owners*. As explained by the HSE Officer 1:

> *"So, for the actions of collecting and monitoring and analysis are done by each department and HSE only disseminate the outcome. It is a very different practice compared to other companies".*

An obvious pattern emerged, which was that the sustainability department of the privately-owned company under study is the BOU, having the highest degree of involvement in generating environmental information. This was done by means

* Business Owners refer to respective general manager in-charge of various departments within the privately-owned company.

of delegating and deciding exactly what information should be collected by the Operational Managers, Technical Team, and Process Review Team.

Additionally, the Officer of a division known as Project Management Team that is in charge of all various sorts of projects, further pointed out that several departments are involved in getting data including procurement and technical.

This is in-line with the findings of Schaltegger, Harms, Horisch, and Windolph (2013) where the sustainability department is generally in-charge of collecting and collating environmental data and departments that are closely involved include HSE department and Corporate Communication department (in this case the Process Review Team). Accounting and Finance departments are the least involved in sustainability management.

4.2.2 Arrays of Environmental Information Collected

Information generated by the companies was also analysed based on the four dimensions of EMA framework which represent four distinct information properties. These information properties include type of information (physical or monetary), the time frame of the information (either future-oriented or past-oriented), the time frame of the decision situation (whether to support long term or short term or both), and how routinely information was being generated (differentiated between ad hoc and routinely generated) (Burritt, Hahn, & Schaltegger, 2002). Table 1 shows the summary on types of information collected by privately-owned company based on the EMA framework.

For example, in the first dimension of physical versus monetary information, privately-owned company also focuses on physical aspect of information where they too measure fuel consumption, as it is considered as one of the biggest operating expenses. The BOU Officer explained that:

> *"Fuel is being used in many areas, like our prime movers, trucks are also consume fuel…The prime movers we have about 450, 300 over owned by us and 80 over are owned by third party. However, all these trucks take fuel from us, from the fuel station inside the compound".*

Additionally, the privately-owned company felt that translation of physical information into monetary based is necessary when dealing with accounting and finance departments. As put forth by the BOU:

> *"Electricity does increase, but the benefits we are getting from converting electricity consumption from kilowatt into financial perspective…dollars and cents give much greater sense for them (referring to Finance department) and that what got us successfully converting traditional fuel consumption vehicles into electrical cars".*

This is also supported by the Project Management Team Officer:

> *"Translation into money…what is the investment, the total amount of money invested in green projects, most of the time we did it at the end of the year. You can translate all these litres into costs based on bill (tariffs) and the usage"*.

A broad spectrum of different kinds of environmental information appeared across the company under study. However, there is a clear indication that the information tends to lean toward physical more than monetary information as measurement for energy, water, amount of waste, and emission produced are in physical units such as kilowatt and kilograms. This suggests that the main emphasis was more on environmental goals and eco-effectiveness (reduced impacts on the natural environment). It is usually expressed in terms of absolute amounts of physical quantities (such as carbon dioxide emissions and ecological footprints), which could be explained by the core goal of sustainability or HSE department, which is to reduce negative environmental impacts.

From the data collected, it showed that attempts in improving environmental efforts are required to reduce the negative impacts and improve efficiency. The core issue was communication between middle and operational management. One of the reasons was a need (or perceived need) to legitimise the collection and use of physical information in terms of the company's economic goals, and frequently also to satisfy senior management's requirement that calculations of cost-effectiveness and impacts on profitability need to be carried out for all activities including those which are sustainability-related to support the setting of targets and the monitoring of performance.

In the next dimension of whether the environmental information is future-oriented or past-oriented, both companies expressed that both types of information were collected with a single purpose: allocation for resources through legitimation of activities and projects. For instance, this privately-owned company uses past oriented information with the reason of getting approval from top management for investment in new projects. As stated by the HSE Officer 1:

> *"Future oriented basically for upcoming projects. Once the project being proposed and initiated, they must have like how costs can be reduce, how much money needed, all must be projected"*.

Clearly, the privately-owned company that focuses on monetary past-oriented information can be interpreted as a search for internal legitimacy by presenting ex-post summary to top management in hoping to secure resources for next period or simply to highlight contributions by sustainability activities toward organisational performance. In other words, it is a way the sustainability manager attempts to seek in legitimatising projects and activities in the eyes of top management.

The third dimension is the short-term versus long-term information generated by the company. The definition between short term and long term largely depends on the nature and context of the company businesses. The understanding of what short term means in practice were found to vary over a range from one week to six months, whereas long term was considered to be any period over a year. However, in this aspect the privately-owned company only focused on past-oriented, short-term such as short-term impact on the environment based on departmental level. As explained by the HSE Officer 1, example of such type of information is the project of changing existing light bulbs into cost saving light bulbs:

> *"I see our company is more on short term. By far, long term again it is only the e-RTG project. The information is more for short term oriented. (…) Like the Prismalence project (the project on change of cost saving light bulbs) I believe is a short term because it started and ended in less than a year".*

Evidently there is some decision situations in sustainability management that are related to planning for the future, including long-term sustainability plan, although targets for future performance are primarily determined on the ground of past performance (example, past-oriented information).

Last dimension is on whether the generated information is on ad hoc, information collected as the need arise or routinely basis, or information generated from routine process (Burrit *et al*., 2002). Even in well-established areas of management which are well served by formal information systems, there still often is a need for ad hoc information exercises for special situations. It was anticipated that the need for ad hoc information to support sustainability management would be greater than the norm since this is both more recent and still fast-developing. For example, the privately-owned company relied a lot on routinely generated information such as amount of energy and water consumption, which is on a monthly basis to monitor their environmental performance.

In a nutshell, the company as a whole displayed all types of information as exhibited in the EMA framework that were generated, except for long-term and future oriented data. However, in many cases, the predominant focus on types of information generated tended toward physical-related information. Although focus on physical information is meant to assist companies in designing methods to improve their environmental performance on certain aspects, strict application increases difficulty for decision makers to assess the impact on economic performance (Schaltegger, 1998). Unwarranted focus on physical information too could cause inefficiency in allocation of resource, for example, a manager may end up risking in one project at the expense of other opportunities that may be of greater potential, both economic and environmental (Bennett et al., 2013).

Companies also demonstrated the tendency toward past-oriented and routine information. The demand for short-term information and its systematisation of its provision could also be translated that companies are actually using environmental information, both for planning and in daily operations. Development of future-oriented information is likely to include a trend toward more routinely collected information and it is being used for planning and supporting daily operations.

Table 1

Summary on Types of Environmental Information

Company	Monetary	Physical	Short Term	Long Term	Past Oriented	Future Oriented	Ad Hoc	Routinely
Privately-Owned	x	x	x		x		x	x

4.3 Users and Usage of Environmental Information

The understanding on the reasons behind the generation of environmental data helps to answer the issue of who are the recipients, whether external or internal. Aside from the coercive pressure of providing governmental regulators on certain environmental information, in the privately-owned company, other users in the middle level, including Process Review Team and the respective Business Owners, also use environmental information. Their purpose of environmental information usage however vary from the regulators as the focus is more on achieving better cost on quantitative non-financial elements, such as waste, effluence, and energy savings. At the top management, they require certain environmental related information mostly to have an overview of current situations and as assessment toward certain departments' performances. As explained by the BOU Officer:

> *"At the top level, they want to see, a higher level, a summary, for example, to the management like to see the KPIs, fuel consumption on prime movers and all these related information".*

Besides, the available environmental information is used as a basis for Process Review Team in deciding the next sustainability project to be undertaken mainly with the purpose of improving internal processes or achieve greater efficiency. They also act as liaison agents among departments, communicating and ensuring the correct and needed information is being properly channelled to the right department(s). As mentioned by the Executive of BOU:

> *"Yes, they are like a categorist, like a trigger because they want to know, move and drive process improvement culture. They come also*

> *play a part in term of linking up what this department knows, what that department knows…So the Process Review team will have to reach to other departments, linking up cross-functional kind of role, to link up the missing information".*

Furthermore, the privately-owned company also started practising carbon accounting. This started back in 2008, as explained by HSE Officer 2.

> *"We had the carbon accounting done since 2008 but some of the figures were sketchy or incomplete. There are compilations of data on energy, water, fuel consumption and carbon emission. Starting from 2012, I started to compile until April 2016, here it showed electricity usage per time, here is fuel usage per time and the carbon emission per time. This is the scope, the CO_2, the electricity and based on the type of infrastructure and equipment".*

The purpose of collecting data for carbon accounting is also used for ranking. According to the CFO:

> *"We actually monitor our carbon emission based on standard imposed by one of our parent companies. Our parent company actually has a rank system; they actually ranked all their 70 subsidiaries in term of CO_2 emission".*

This was supported with the explanation from HSE Officer 2, who further added:

> *"So, we want to capture, what have we done right, what we can improve on but we cannot do that without capturing all the information".*

This finding is supported by International Federation of Accountants (IFAC) (2005), where collected physical information can help organisations to effectively manage environmental impact, which tracks and reduces the amount of resources used.

5.0 Conclusion

In this study, it showed a number of external and internal pressures that shape environmental practices of this privately-owned company. The external pressures are mainly exerted by the government laws and regulations, but on the other hand, there are also internal pressures in play such as one of the owners' strong environmental management culture that leads to the need to gain and maintain legitimacy. The findings also revealed that a variety of users including

operational managers, technical employees, process review team, and business owners are also involved in generating environmental information, however with health, safety, and environmental departments pushing for such practices.

Involvement of other departments in producing and monitoring of environmental information plays a role in reducing the load on the sustainability department and this could mean that lesser resources are needed in generating information, therefore allowing the company to focus more on analysis and on linking different information items to develop strategic insights. This will be useful for the company as the future direction of the industry is heading toward sustainability and the ability to develop sustainable strategies, which will ultimately give them the needed competitive advantage.

Although it is less predicted that the HSE department is identified as both primary generator and recipient of environmental information, it has however raised the question whether this could indicate a lack of interest and involvement by other functions, especially accounting, since one way to achieve legitimacy is through accounting processes (Covaleski & Dirsmith, 1988; as cited in Tooley & Guthrie, 2007). The connection was made largely due to accounting being a logical process with a set of procedures that will generate superior information leading to a more informed and rational decision-making in the selection of optimal organisational strategies. Finally, this paper emphasises that the findings from this study is part of a larger on-going research project.

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